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(Modified) PTO/SB/08A-B (10-96)  
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Substitute for form 1449A-B/PTO

INFORMATION DISCLOSURE  
STATEMENT BY APPLICANT

(use as many sheets as necessary)

## Complete if Known

Application Number	09/415,183-09/685,189
Filing Date	October 7, 1999-10/0/00
First Named Inventor	Volker Heinrichs
Group Art Unit	1623
Examiner Name	Unassigned
Attorney Docket Number	02-101500US

## U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, lines, Where Relevant Passages or Relevant Figures Appeal
		Number	Kind Code (if known)			
[Signature]	AA	6,096,548		Stemmer	08-01-2000	
	AB	5,824,469		Horowitz et al.	10-20-1998	
	AC	6,087,341		Khavari et al.	07-11-2000	

## FOREIGN PATENT DOCUMENTS

Examiner Initials	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		Office	Number	Kind Code (if known)				
[Signature]	AD	WO	00/04190		Maxygen, Inc.	01-27-2000		
	AE	WO	00/06718		California Institute of Technology	02-10-2000		
	AF	WO	00/09682		Maxygen, Inc.	02-24-2000		
	AG	WO	00/09727		Maxygen, Inc.	02-24-2000		
	AH	WO	00/12680		Maxygen, Inc.	03-09-2000		
	AI	WO	00/18778		Phylos, Inc.	04-06-2000		
	AJ	WO	00/18906		Maxygen, Inc.	04-06-2000		
	AK	WO	00/20573		Maxygen, Inc.	04-13-2000		
	AL	WO	00/28008		Maxygen, Inc.	05-18-2000		
	AM	WO	00/28017		Maxygen, Inc.	05-18-2000		
	AN	WO	00/28018		Maxygen, Inc.	05-18-2000		
	AO	WO	98/31816		Regents of the University of Minnesota	07-23-1998		
	AP	WO	99/29902		California Institute of Technology	06-17-1999		
	AQ	WO	99/51774		Tellus Genetic Resources, Inc.	10-14-1999		

## OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

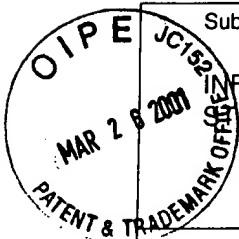
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T
[Signature]	AR	AFFHOLTER & ARNOLD Engineering a revolution. <u>Chemistry in Britain</u> 35:48-51	
	AS	AFFHOLTER & ARNOLD, Engineering a revolution. <u>Chemtech</u> 29:34-39	

Examiner Signature	[Signature]	Date Considered	03/19/02
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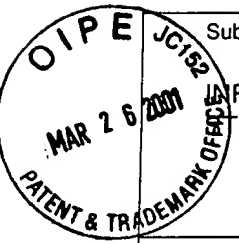
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Group Art Unit	1623
Examiner Name	Unassigned
Attorney Docket Number	02-101500US

AT	AFFHOLTER and STEMMER (1998) Directed evolution of proteins and pathways by DNA shuffling <u>Book of Abstracts, 216<sup>th</sup> ACS National Meeting Boston, August 23-27, BTEC-042</u>
AU	CRAMERI et al., (1993) 1020 -Fold aptamer library amplification without gel purification" <u>Nuc. Acid Res. 21(18): 4410</u>
AV	HOWARD, (1998) Chemistry of the future: Exploitation of the power of biology. <u>Book of Abstracts, 216<sup>th</sup> ACS National Meeting Boston, August 23-27, BTEC-045</u>
AW	LEONG et al., Maximizing the genetic diversity by molecular breeding: evolution of DNA... <u>1999 Winter Biotechnology Conference: Molecular Approaches to Vaccine Design, Dec. 2-5 (1999)</u>
AX	PATTEN et al., (1997) Applications of DNA shuffling to pharmaceuticals and vaccines. <u>Current Opinion in Biotech. 8:724-733</u>
AY	PUNNONEN et al., (1998) Evolution of genetic vaccines by DNA shuffling <u>Keystone Symposium on Molecular Aspect of Viral Immunity Tamarron, CO, Feb. 16-22, 1998</u>
AZ	PUNNONEN et al., Evolution of DNA vaccine vectors, antigens, and adjuvant cytokines by DNA shuffling <u>Keystone Symposium on DNA vaccines, Snowbird, UT, April 12-17, 1999</u>
BA	PUNNONEN, et al., (1997) Evolution of DNA vaccine vectors by DNA shuffling <u>The First Gordon Conference on Genetic Vaccines/DNA Vaccines Plymouth State College, Plymouth, NH, July 20-25, 1997</u>
BB	SOONG et al., (1998) "Directed evolution of novel retroviral tropisms by DNA shuffling <u>Abstract #97, Programs &amp; Abstracts, 1<sup>st</sup> Annual Meeting of the American Society of Gene Therapy May 28-31, 1998, Seattle, WA</u>
BC	SOONG et al., "Directed evolution of novel retroviral tropisms by DNA shuffling" <u>Abstract, Retroviruses, 1998 Meeting, May 26-31, 1998 Cold Spring Harbor Laboratory, Cold Spring Harbor, NY.</u>
BD	SOONG et al., "DNA shuffling as a tool to evolve desired retroviral phenotypes" Abstract, p. 228 <u>Gene Therapy, 1998 Meeting Sept. 23-27, 1998 Cold Spring Harbor Laboratory, Cold Spring Harbor, NY</u>
BE	STEMMER "Directed evolution of enzymes and pathways by DNA shuffling" <u>FASEB Journal 13(7): A1431</u>
BF	STEMMER et al., Molecular evolution of genes and pathways by DNA shuffling. <u>FASEB Journal 11(9): A1124</u>
BG	STEMMER, Directed evolution of enzymes and pathways by DNA shuffling. <u>Book of Abstracts, 217<sup>th</sup> ACS National Meeting, Anaheim, CA March 21-25, BIOT-080</u>
BH	STEMMER, Directed evolution of proteins, pathways, episomes and viruses by DNA shuffling <u>FASEB Journal 12(8): A1303</u>
BI	STEMMER, DNA sequence evolution by sexual PCR. <u>Experientia (Basel) 52(ABSTR): A25.</u>
BJ	TOBIN et al., Colorless green ideas... <u>Nature Biotechnology 17:333-334</u>

Examiner Signature	<i>Pat La</i>	Date Considered	<i>2/14/02</i>
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Application Number	<del>09/415,183</del> 09/685,189
Filing Date	<del>October 7, 1999</del> 10/16/00
First Named Inventor	Volker Heinrichs
Group Art Unit	1623
Examiner Name	Unassigned
Attorney Docket Number	02-101500US

h	BK	WELCH et al., DNA shuffling of diverse natural genes to produce industrial enzymes with novel properties. 99:507-508 Meeting info: <u>99<sup>th</sup> General Meeting of the American Society for Microbiology, Chicago, IL May 30 - June 3, 1999</u>	
l	BL	WRIGHT et al., Evolution of viruses and vectors by DNA shuffling: Applications in vaccination... <u>1999 Winter Biotechnology Conference: Molecular Approaches to Vaccine Design, Dec. 2-5 (1999)</u>	

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## INFORMATION DISCLOSURE STATEMENT BY APPLICANT

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### Complete if Known

Application Number **09/415,183** 09/18/85,189  
 Filing Date **October 7, 1999** 10/6/00  
 First Named Inventor **Volker Heinrichs**  
 Group Art Unit **1646**  
 Examiner Name **Andres, J.**  
 Attorney Docket Number **02-101500US**

### U.S. PATENT DOCUMENTS

Examiner Initials	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, lines, Where Relevant Passages or Relevant Figures Appeal
		Number	Kind Code (if known)			
<i>AA</i>	AA	5,866,363		Peiczenik	02-02-1999	
	AB	5,956,408		Arnold	09-21-1999	
	AC	6,001,574		Short, et al.	12-14-1999	
	AD	6,004,788		Short	12-21-1999	
	AE	6,030,779		Short	02-29-2000	
	AF	6,054,267		Short	04-25-2000	
	AG	6,057,103		Short	05-02-2000	
	AH	6,117,679		Stemmer	09-12-2000	
	AI	6,132,970		Stemmer	10-17-2000	
	AJ	6,165,793		Stemmer	10-26-2000	
	AK	6,168,919		Short	01-02-2001	
	AL	6,171,820		Short	01-09-2001	
	AM	6,174,673		Short, et al.	01-16-2001	
<i>AN</i>	AN	6,180,406		Stemmer	01-30-2001	

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		Office	Number	Kind Code (if known)				
<i>AO</i>	AO	WO	00/42560		Maxygen, Inc.	07-20-2000		
	AP	WO	00/42561		Maxygen, Inc.	07-20-2000		
	AQ	WO	00/53744		Diversa Corporation	09-14-2000		
	AR	WO	00/58517		Diversa Corporation	10-05-2000		

### OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS

Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T

Examiner Signature	<i>Andres</i>	Date Considered	03/14/02
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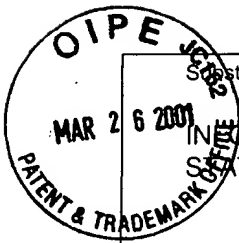
Examiner Initials	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, lines, Where Relevant Passages or Relevant Figures Appeal
		Number	Kind Code (if known)			
/	AA	5,512,463		Stemmer	04-30-1996	
/	AB	5,514,588		Varadaraj	05-07-1996	
/	AC	5,605,793		Stemmer	02-25-1997	
/	AD	5,763,239		Short et al.	06-09-1998	
/	AE	5,789,228		Lam et al.	08-04-1998	
/	AF	5,811,238		Stemmer et al.	09-22-1998	
/	AG	5,814,473		Warren et al.	09-29-1998	
/	AH	5,830,696		Short	11-03-1998	
/	AI	5,830,721		Stemmer et al.	11-03-1998	
/	AJ	5,834,252		Stemmer et al.	11-10-1998	
/	AK	5,837,458		Minushull et al.	11-17-1998	
/	AL	5,876,997		Kretz	03-02-1999	
/	AM	5,925,749		Mathur, et al.	07-20-1999	
/	AN	5,928,905		Stemmer, et al.	07-27-1999	
/	AO	5,939,250		Short, Jay M.	08-17-1999	
/	AP	5,939,300		Robertson, et al.	08-17-1999	
/	AQ	5,942,430		Robertson, et al.	08-24-1999	
/	AR	5,948,666		Callen, et al.	09-07-1999	
/	AS	5,958,672		Short, Jay M.	09-28-1999	
/	AT	5,958,751		Murphy, et al.	09-28-1999	
/	AU	5,962,258		Mathur, et al.	10-05-1999	
/	AV	5,962,283		Warren et al.	10-05-1999	
/	AW	5,965,408		Short, Jay M.	10-12-1999	
/	AX	5,985,646		Murphy, et al.	11-16-1999	

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Attorney Docket Number	02-101500US

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Examiner Initials	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		Office	Number	Kind Code (if known)				
JAC	AY	WO	97/07205		Novo Nordisk A/S	02-27-1997		
	AZ	WO	97/20078		Affymax Technologies	06-05-1997		
	BA	WO	97/25410		Novo Nordisk A/S	07-17-1997		
	BB	WO	97/35957		Maxygen, Inc.	10-02-1997		
	BC	WO	97/35966		Maxygen, Inc.	10-02-1997		
	BD	WO	97/44361		Recombinant Biocatalysis Inc.	11-27-1997		
	BE	WO	97/48416		Recombinant Biocatalysis, Inc.	12-24-1997		
	BF	WO	97/48717		Recombinant Biocatalysis Inc	12-24-1997		
	BG	WO	97/48794		Recombinant Biocatalysis Inc	12-24-1997		
	BH	WO	98/00526		Recombinant Biocatalysis Inc	01-08-1998		
	BI	WO	98/01581		Recombinant Biocatalysis Inc	01-15-1998		
	BJ	WO	98/13485		Maxygen, Inc.	04-02-1998		
	BK	WO	98/13487		Maxygen, Inc.	04-02-1998		
	BL	WO	98/24799		Diversa Corp.	06-11-1998		
	BM	WO	98/27230		Maxygen, Inc.	06-25-1998		
	BN	WO	98/28416		Novo Nordisk A/S	07-02-1998		
	BO	WO	98/31837		Maxygen, Inc.	07-23-1998		
	BP	WO	98/36080		Maxygen, Inc.	08-20-1998		
	BQ	WO	98/41622		Novo Nordisk A/S	09-24-1998		
	BR	WO	98/41623		Novo Nordisk A/S	09-24-1998		
	BS	WO	98/41653		Novo Nordisk A/S	09-24-1998		
	BT	WO	98/42832		California Institute of	10-01-1998		

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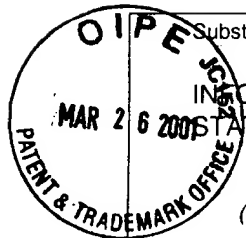
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First Named Inventor	Volker Heinrichs
Group Art Unit	1623
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Attorney Docket Number	02-101500US

				Technology			
BU	WO	98/48034		Diversa Corp.	10-29-1998		
BV	WO	98/58085		Diversa Corp.	12-23-1998		
BW	WO	99/07837		Diversa Corp.	02-19-1999		
BX	WO	99/08539		Diversa Corp.	02-25-1999		
BY	WO	99/10472		Diversa Corp.	03-04-1999		
BZ	WO	99/10539		Diversa Corp.	03-04-1999		
CA	WO	99/19518		Diversa Corp.	04-22-1999		
CB	EP	0911396A2		Maxygen, Inc.	04-28-1999		
CC	WO	99/21979		Maxygen, Inc.	05-06-1999		
CD	EP	0911376A3		Maxygen, Inc.	05-06-1999		
CE	WO	99/23107		Maxygen, Inc.	05-14-1999		
CF	WO	99/23236		Diversa Corp.	05-14-1999		
CG	EP	0934999A1		Maxygen, Inc.	08-11-1999		
CH	WO	99/41368		Maxygen, Inc.	08-19-1999		
CI	WO	99/41369		Maxygen, Inc.	08-19-1999		
CJ	WO	99/41383		Maxygen, Inc.	08-19-1999		
CK	WO	99/41402		Maxygen, Inc.	08-19-1999		
CL	WO	99/45154		Diversa Corp.	09-10-1999		
CM	WO	99/57128		Maxygen, Inc.	11-11-1999		
CN	WO	99/65927		Maxygen, Inc.	12-23-1999		

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		Number	Kind Code (if known)					
1/	AA	5,001,065		Larrizk et al.	03-19-1991			
	AB	5,270,170		Schatz et al.	12-14-1993			
	AC	5,358,665		Sienkowski	10-25-1994			

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		Office	Number	Kind Code (if known)				
1/	AD	WO	95/22625		Affymax Technologies	08-24-1995		
	AE	WO	96/33207		Glaxo Group LTD	10-24-1996		
	AF	WO	97/35957		Maxygen, Inc.	10-02-1997		

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS						
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1/	AG	STEMMER (1995) "The Evolution of Molecular Computation" <i>Science</i> 270:1215				
	AH	STEMMER et al., (1995) "Single-step assembly of a gene and entire plasmid form large numbers of oligodeoxyribonucleotides" <i>Gene</i> 164:49-53				
	AI	STEMMER (1995) "Searching Sequence Space" <i>Bio/Technology</i> 13:549-553				
	AJ	STEMMER (1994) "DNA shuffling by random fragmentation and reassembly: In vitro recombination for molecular evolution" <i>Proceedings of the National Academy of Sciences, USA</i> 91:10747-10751				
	AK	STEMMER (1996) "Sexual PCR and Assembly PCR" <i>The Encyclopedia of Molecular Bioogy</i> pp 447-457				
	AL	STEMMER (1994) "Rapid evolution of a protein in vitro by DNA shuffling" <i>Nature</i> 370:389-391				
	AM	GATES et al., (1996) "Affinity selective isolation of ligands from peptide libraries through display on a lac repressor 'headpiece dimer'" <i>Journal of Molecular Biology</i> 255:373-386				
	AN	CRAMERI et al., (1997) "Molecular evolution of an arsenate detoxification pathway by DNA shuffling" <i>Nature Biotechnology</i> 15:436-438				
	AO	ZHANG et al., (1997) "Directed evolution of an effective fucosidase from a galactosidase by DNA shuffling and screening" <i>Proceedings of the National Academy of Sciences, U.S.A.</i> 94:4504-4509				
	AP	CRAMERI et al., (1996) "Construction and evolution of antibody-phage libraries by DNA shuffling" <i>Nature Medicine</i> 2:100-103				
	AQ	CRAMERI et al., (1996) "Improved green fluorescent protein by molecular evolution using DNA shuffling" <i>Nature Biotechnology</i> 14:315-319				

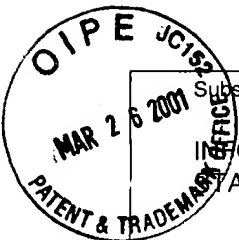
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	First Named Inventor	Volker Heinrichs
	Group Art Unit	1623
	Examiner Name	Unassigned
	Attorney Docket Number	02-101500US

AR	CRAMERI and STEMMER (1995) "Combinatorial multiple cassette mutagenesis creates all the permutations of mutant and wildtype cassettes" <i>BioTechniques</i> 18:194-195	
AS	Henco, K. et al., (1985) <i>J. Mol. Biol.</i> 185:227-260.	
AT	Ness et al., (1999) "DNA Shuffling of subgenomic sequences of subtilisin" <i>Nature Biotechnology</i> 17:893-896	
AU	Chang et al., (1999) "Evolution of a cytokine using DNA family shuffling" <i>Nature Biotechnology</i> 17:793-797	
AV	CHRISTIANS et al., (1999) "Directed evolution of thymidine kinase for AZT phosphorylation using DNA family shuffling " <i>Nature Biotechnology</i> 17:259-264	
AW	CRAMERI et al., (1998) "DNA shuffling of a family of genes from diverse species accelerates directed evolution" <i>Nature</i> 391:288-291	

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Examiner Signature	<i>[Signature]</i>	Date Considered	03/19/00
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INFORMATION DISCLOSURE STATEMENT BY APPLICANT  (use as many sheets as necessary)	Substitute for form 1449A-B/PTO		Complete if Known	
	Application Number		09/415,183 09/085,189	
	Filing Date		October 7, 1999 10/6/00	
	First Named Inventor		Volker Heinrichs	
	Group Art Unit		1623	
	Examiner Name		Unassigned	
Attorney Docket Number		02-101500US		

U.S. PATENT DOCUMENTS						
Examiner Initials	Cite No.	U.S. Patent Document		Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, lines, Where Relevant Passages or Relevant Figures Appear
		Number	Kind Code (if known)			

FOREIGN PATENT DOCUMENTS								
Examiner Initials	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		Office	Number	Kind Code (if known)				

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS			
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.	T
1	AA	BENOIT P et al., (1993) <i>J. Immunol.</i> 150(3):707	
	AB	Bonnem, E.M. et al., (1981) <i>J. Biol. Response Modifiers</i> 3:580.	
	AC	Davis, G. L. et al., (1989) <i>N. England J. Med.</i> 321: 1501.	
	AD	Dusekeiko, G. M. (1997) <i>Hepatology</i> 26:112S-121S	
	AE	Duskeiko, G.M. et al., (1986) <i>J. Hematology</i> 3 (Supl. 2): S199.	
	AF	Finter, N.B. et al., (1991) <i>Drugs</i> 42(5): 749	
	AG	Funke, I. et al., (1994) <i>Ann. Hematol.</i> 68:49-52	
	AH	Kashima, H. et al. (1988) <i>Laryngoscope</i> 98:334.	
	AI	MINSHULL AND STEMMER (1999) "Protein evolution by molecular breeding" <i>Current Opinion in Chemical Biology</i> 3:284-290	
	AJ	Oldham, R.K. (1985) <i>Hospital Practice</i> 20:71.	
	AK	PATTEN et al., (1997) "Applications of DNS Shuffling to Pharmaceuticals and Vaccines" <i>Current Opinion in Biotechnology</i> 8:724-733	
	AL	Pontzer, C. H. et al., (1991) <i>Cancer Res.</i> 51:5304.	
	AM	SCAROZZA, A.M. et al., (1992) <i>J. Interferon Res.</i> 12:35-42	
	AN	Schomburg, A. et al., (1993) <i>J. Cancer Res. Clin. Oncol.</i> 119: 745-755.	
	AO	Sprang, S. R. et al. (1993) <i>Curr. Opin. Struct. Biol.</i> 3:815-827.	
	AP	STEMMER et al., "(1999) "Molecular Breeding of viruses for targeting and other clinical properties" <i>Tumor Targeting</i> 4:1-4	
	AQ	Vial, T. & Descotes, J. (1994) <i>Drug Experience</i> 10:115-150.	

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Examiner Signature		Date Considered	05/17/02
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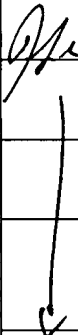


<b>INFORMATION DISCLOSURE STATEMENT BY APPLICANT</b>  (use as many sheets as necessary)	Substitute for form 1449A-B/PTO		Complete if Known	
	Application Number		09/685,189	
	Filing Date		October 6, 2000	
	First Named Inventor		Volker Heinrichs	
	Group Art Unit		1647	
	Examiner Name		Unassigned	
Attorney Docket Number		02-101510US		

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		Number	Kind Code (if known)			

FOREIGN PATENT DOCUMENTS								
Examiner Initials	Cite No.	Foreign Patent Document			Name of Patentee or Applicant of Cited Document	Date of Publication of Cited Document MM-DD-YYYY	Pages, Columns, Lines, Where Relevant Passages or Relevant Figures Appear	T
		Office	Number	Kind Code (if known)				
He	AA	WO	83/02457		Innis	07-21-1983		
↓	AB	WO	00/52153		Howard et al.	09-08-2000		

OTHER PRIOR ART - NON PATENT LITERATURE DOCUMENTS				
Examiner Initials	Cite No.	Include name of the author (in CAPITAL LETTERS), title of the article (when appropriate), title of the item (book, magazine, journal, serial, symposium, catalog, etc.), date, page(s), volume-issue number(s), publisher, city and/or country where published.		T
	AC	Allen, G., et al., (1996). "Nomenclature of the Human Interferon Proteins," <i>J. Interferon and Cytokine Research</i> , 16:181-184. ~		
	AD	Diaz, M.O., et al., (1996) "Nomenclature of the Human Interferon Genes," <i>J. Interferon and Cytokine Research</i> , 16:179-180.		
	AE	Goeddel et al., (1981) "The Structure of eight distinct cloned human leukocyte interferon cDNAs." <i>Nature</i> 290:20-26.		
	AF	Gren et al., (1984) "Novel Human Leukocyte Interferon Subtype and Structural Comparison of Alpha Interferon Genes" and the corresponding EMBL database printout. <i>Journal of Interferon Research</i> 4:609-617. ~		

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